REMARKS

Claim Rejections - 35 USC §102

Claims 1-2, 6-7, 11-12, and 16-17, are rejected under 35 U.S.C. §102(b) as being anticipated by Tobin, et al. (U.S. Patent 5,982,920, hereinafter "Tobin").

Tobin discloses an apparatus and method for performing automated defect spatial signature analysis on a data set representing defect coordinates and wafer processing information, including categorizing data from the data set into a plurality of high level categories, classifying the categorized data contained in each high level category into user-labeled signature events, and correlating the categorized, classified signature events to a present or incipient anomalous process condition.

Regarding claim 1, 6, 11, and 16, Applicants respectfully traverse the rejections since the Applicants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Tobin of:

"applying a clustering method to the first data to create a clustered first data;"

The Examiner states:

> "Regarding claim (*sic*) 1, 6, 11, 16 (*sic*) Tobin teaches...applying a clustering method to the first data to create a clustered first data (Column 2, Lines 40-48);" [deletion for clarity]

Applicants respectfully disagree because Tobin does not disclose or even mention "applying a clustering method...to create a clustered first data" in Column 2, Lines 40-48, which states:

> "These and other objects of the invention are met by providing a method of performing automated defect spatial signature analysis which includes the steps of producing a wafer map which includes data representing defect coordinates and wafer processing information, categorizing the data into a plurality of categories, each containing different types of signature events, and correlating a categorized signature event to a present or incipient anomalous process condition." [underlining for clarity]

Also regarding claims 1, 6, 11, and 16, Applicants respectfully traverse the rejections since the Applicants' claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Tobin of:

"correlating the clustered first data with the second data to determine analyzed data."

The Examiner states:

> "Regarding claim (*sic*) 1, 6, 11, 16 (*sic*) Tobin teaches...correlating the clustered first data with the second data to determine analyzed data (Column 2, Lines 40-48)." [deletion for clarity]

Applicants respectfully disagree because Tobin does not disclose or even mention that "clustered first data" is correlated in Tobin Column 2, Lines 40-48, which states:

> "These and other objects of the invention are met by...correlating a categorized signature event to a present or incipient anomalous process condition." [deletion and underlining for clarity]

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 U.S.C. §102(b) as not being anticipated by Tobin because:

> "Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration." W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing Soundscriber Corp. v. United States, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). Carella v. Starlight Archery, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), *modified on reh'g*, 1 USPQ 2d 1209 (Fed. Cir. 1986); RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

Regarding claims 2, 7, 12, and 17, these dependent claims respectively depend from independent claims 1, 6, 11, and 16, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations, including the limitation as exemplified in claim 2 wherein:

"the clustering method is spatial signature analysis."

The Examiner states:

> "Regarding claim (*sic*) 2, 7, 12, 17 (*sic*) Tobin teaches a method wherein the clustering method is spatial signature analysis (Column 2, Lines 23-25)."

Applicants respectfully disagree because Tobin does not disclose or even mention "the clustering method" in column 2, lines 23-25, which states:

> "An object of the present invention is to provide a method and apparatus for spatial signature analysis which is capable of quickly and correctly evaluating wafer map data."

Based on the above, it is respectfully submitted that claims 2, 7, 12, and 17 are allowable under 35 U.S.C. §102(b) as not being anticipated by Tobin because:

> "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" [*emphasis added*] Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co. (730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed Dir. 1983)))

Regarding claims 5, 10, 15, and 20, these dependent claims respectively depend from independent claims 1, 6, 11, and 16, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations, including the limitation as exemplified in claim 5 wherein:

> "the analyzed data is selected from a group consisting of wafer mapping, commonality, or correlation."

The Examiner states

> "Regarding claim (*sic*) 5, 10, 15, 20 (*sic*) Tobin teaches a method wherein the analyzed data is selected from a group consisting of wafer mapping (Page (*sic*) 3, Lines 50-58), commonality, or correlation."

Applicants respectfully disagree because Tobin does not disclose or even mention "analyzed data" being the result of correlating clustered data with other data from wafer mapping in Tobin column 3, lines 50-58, which states:

> "FIG. 2 shows a flow chart for software used to implement the present system. A grey-scale density image $\rho(x,y)$, is generated from the electronic

> wafer map for processing. That density image can be considered a composite of several overlaying events within the wafer map data. The initial focus of wafer map signature analysis is to reduce the data set to simpler, non-overlapping (or nearly non-overlapping) sets that can be individually analyzed and finally classified to a user-defined class." [underlining for clarity]

Based on the above, it is respectfully submitted that claims 5, 10, 15, and 20 are allowable under 35 U.S.C. §102(b) as not being anticipated by Tobin because:

> "A claim is anticipated only if each and every element *as set forth in the claim* is found, either expressly or inherently described, in a single prior art reference. (Kalman v Kimberley Clark Corp., 713 Fed. 2nd 760, 771, 218 USPQ 781, 789 (Fed. Circ. 1983), *Cert. Denied*, 465 U.S. 1026, 224 USPQ 520, 1984.)"

Claim Rejections - 35 USC §103

Claims 3, 8, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tobin, et al. (U.S. Patent 5,982,920, hereinafter "Tobin") in view of Leung et al. (U.S. Patent 6,397,166, hereinafter "Leung").

Tobin has been summarized above.

Leung teaches a method and system for grouping multiple data points, each data point being a set (e.g., a vector, a tuple, etc.) including a measured dependent value and at least one related independent variable value, including fitting the data into a model relating the independent and dependent variables of the data, and calculating similarity and distance between the data points and groups of the data points, thereby to group the multiple data points.

Regarding claims 3, 8, 13, and 18, these dependent claims respectively depend from independent claims 1, 6, 11, and 16, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including the limitation as exemplified in claim 3 wherein:

> "the clustering method is K-means clustering."

The Examiner states:

> "Regarding claim (*sic*) 3, 8, 13, 18 (*sic*) Tobin discusses all the limitations as mentioned above. However, Tobin does not teach a method wherein the clustering method is K-means clustering."

Applicants respectfully disagree because Tobin does not disclose or even mention any of the claimed limitations as explained above. Applicants agree that Tobin does not teach or suggest K-means clustering.

The Examiner continues:

> "It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a method wherein the clustering method is K-means clustering as taught by Leung into Tobin for the purpose of further optimizing partitions within a data set (Leung, Background of the Invention, Column 1, Lines 58-67)."

Applicants respectfully disagree because the Leung Background of the Invention states that the invention is unrelated to the Tobin automated defect spatial signature analysis of semiconductor wafers but instead is related to retail sales systems as stated in Leung column 1, lines 8-14, which states:

> "The present invention generally relates to a computer-implemented method for clustering retail sales data, and more particularly to a method which assumes a model of retail demand as a function, for example, of the price, base sales rate, and seasonal factors, and clusters together items that have, for example, the same seasonal and price effect factors based on the model fit." [underlining for clarity]

Further, Leung column 1, lines 20-23, introduces the basis for the clustering taught in Leung column 1, lines 58-67, by stating that the analysis is for retail sales:

> "The basic data for cluster analysis is a set of N entities for each of which p attribute values have been observed (e.g., N retail items for each of which the last 52 weeks of sales has been observed)." [underlining for clarity]

Therefore, the combination of Tobin and Leung taken as a whole would be combining a wafer analysis system with a retail sales system. It is respectfully submitted that the suggested combination would not be obvious to one having ordinary skill in the art.

Based on the above, it is respectfully submitted that claims 3, 8, 13, and 18 are allowable under 35 U.S.C. §103(a) as being patentable over Tobin in view of Leung because:

> "The question is whether the prior art, considering its scope and content and the level of ordinary skill, must itself suggest the combination of separate elements into the claimed invention in suit, not just whether it illustrates separate elements..." Laitram Corp. v. Cambridge Wire Cloth Co., 226 USPQ 298 at 293n (D. Md. Mag. 1985), aff'd in part, rev'd in part, and remanded, 785 F.2d 292, 228 USPQ 935 (Fed. Cir. 1986), cert. denied, 479 U.S. 820 (1986)

Claims 4, 9, 14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tobin, et al. (U.S. Patent 5,982,920, hereinafter "Tobin") in view of Arai et al. (U.S. 2002/0145430 Al, hereinafter "Arai").

Tobin has been summarized above.

Arai teaches a method and an apparatus for computing a charging state of a battery without being affected by an influence of polarization\. First computing means computes a voltage-current characteristic, including the influence of the polarization during an decrease of a discharge current of the battery on the basis of a terminal voltage and discharge current measured while the battery carries out a constant load discharge with a current value large enough to cancel a charge-side polarization arisen in the battery at least just before the discharge. A second computing means shifts the voltage-current characteristic to a specific extent in the direction of a voltage coordinate axis. A residual voltage drop value in advance stored by storing means is added to a present estimated voltage value estimated by estimating means on the basis of the shifted voltage-current characteristic, and thereby a present open circuit voltage of the battery is computed.

Regarding claims 4, 9, 14, and 19, these dependent claims respectively depend from independent claims 1, 6, 11, and 16, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations, including the limitation as exemplified in claim 4 wherein:

"the first data is selected from a group consisting of IV curves and V_t distributions."

The Examiner states:

> "Regarding, claim (*sic*) 4, 9, 14, 19 (*sic*) Tobin teaches all the limitations discussed above however, Tobin does not teach a method wherein the first data is selected from a group consisting of IV curves and Vt distributions."

Applicants respectfully disagree because Tobin does not disclose or even mention any of the claimed limitations as explained above. Applicants agree that Tobin does not teach or suggest a method wherein the first data is selected from a group consisting of IV curves and Vt distributions.

The Examiner continues:

> "It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a method wherein the first data is selected from a group consisting of IV curves and Vt distributions as taught by Aria into Tobin for the purpose of optimally estimating electrical data."

Applicants respectfully disagree because the Examiner has not provided a citation supporting the above and used the same rationale, which was prohibited in *In re* Sang-Su Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). In this case, the application was directed to a method of automatically displaying functions of a video display device and demonstrating how to select and adjust the function in order to facilitate response by the user. The examiner rejection was based on obviousness based on two references. One reference was for a television menu for adjusting the picture and audio functions without a demonstration of how to adjust the functions. The other reference was for a videogame having a demonstration mode without showing adjusting the picture or audio functions. The Examiner's rationale for the combination was that it:

> "would have been obvious to one of ordinary skill in the art since the demonstration mode is just a programmable feature which can be used in many different device(s) for providing automatic introduction by adding the proper programming software," and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial."

On appeal to the Board, the Board upheld the rejection by stating:

> "The conclusion of obviousness may be made from common knowledge and common sense of a person of ordinary skill in the art without any specific hint or suggestion in a particular reference."

The Court of Appeals for the Federal Circuit vacated and remanded stating in particular that the Board's rejection of the need "for any specific hint or suggestion in a particular reference" to support the combination of the references was an "[o]mission of a relevant factor required by precedent [which] is both legal error and arbitrary agency action." [insertion and underlining for clarity]

Further, Applicants respectfully disagree because the Arai Abstract states that the invention is unrelated to the Tobin automated defect spatial signature analysis of semiconductor wafers but is related instead to the charging states of batteries as stated in Arai Abstract first sentence, which states:

> "A method and an apparatus for computing a charging state of a battery without being affected by an influence of polarization are provided. " [underlining for clarity]

Therefore, the combination of Tobin and Arai taken as a whole would be combining a wafer analysis system with a battery charging system. It is respectfully submitted that the suggested combination would not be obvious to one having ordinary skill in the art.

Based on the above, it is respectfully submitted that claims 4, 9, 14, and 19 are allowable under 35 U.S.C. §103(a) as being patentable over Tobin in view of Arai because:

> "One cannot...pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *In re* Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992).

The other references cited by the Examiner showing the prior art have been considered and are not believed to disclose, teach, or suggest, either singularly or in combination, Applicants' invention as claimed.

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-20 at an early date is solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 01-0365 and please credit any excess fees to such deposit account.

Respectfully submitted,

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